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**RACIAL DIFFERENCES IN ACCIDENTAL AND VIOLENT
DEATHS AMONG U. S. NAVY PERSONNEL**

L. A. PALINKAS

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**RACIAL DIFFERENCES IN ACCIDENTAL AND VIOLENT DEATHS
AMONG U.S. NAVY PERSONNEL**

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SUMMARY

Problem

Each year, accidents, poisonings and violence account for the greatest number of hospitalizations and deaths among U.S. Navy personnel. Research among both naval and civilian populations has shown that Blacks are at significant risk for deaths due to these external causes, relative to whites. However, the results of a previous study of health risks among enlisted personnel indicated that Black males are hospitalized less frequently for accidental injuries than whites:

Objective

The objective of this study was to examine the death rates of black and white enlisted personnel between 1974 and 1979 to determine if either racial group was at significant risk, relative to the other group, of death due to accidents, poisonings and violence.

Approach

A cross-sectional study was conducted of all deaths with ICDA-8 diagnoses of accidents, poisonings and violence among enlisted personnel between 1974 and 1979. Primary diagnosis, cause of death, and trauma classification were examined on the basis of age, race, sex, occupation, pay grade, and length of service.

Results

Between 1974 and 1979, there were 2,687 deaths due to accidents, poisonings and violence among enlisted naval personnel. Of this number, 2,281 were white males and 278 were black males. Blacks displayed a significantly higher mortality rate. Blacks were found to be at significant risk for death from adverse effects, toxic effects, and homicides. The risk of death due to adverse effects for blacks was 3.3 times greater than it was for whites. Most of the deaths due to adverse effects among both racial groups were attributed to unspecified drugs, followed by adverse effects from analgesics and antipyretics, particularly opiates and synthetic analogs. The relative risk of death from toxic effects for blacks was 2.0, with drownings accounting for the largest percentage of deaths. The homicide rate for blacks also was three times higher than the homicide rate for whites. No consistent relationship between mortality and age or in-service socioeconomic status was discerned for either racial group.

Conclusion

The results of this study indicate that blacks are not exposed to any more severe on-duty occupational or environmental hazards, with the exception of drowning, than whites. They are exposed, however, to a greater risk of assaults by others, due perhaps to their racial status and off-base residential environments. While in-service sociocultural status does not appear to be related to the risk of death for either racial group, pre-service sociocultural factors may play a role in accounting for the high death rates among older black males. It is suggested, however, that these rates may decline as the pre-service sociocultural status of younger black males becomes the norm for all blacks in the Navy.

Recommendations

Greater awareness of the hazards of improper use of drugs and medications and greater concern for water safety, especially among older black males, is indicated.

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Racial Differences in Accidental and Violent Deaths Among U.S. Navy Personnel

Each year, accidents, poisonings and violence account for the greatest number of hospitalizations and deaths among U.S. Navy personnel. Accidental and violent injuries accounted for almost 27% of all days lost because of hospitalizations for Navy enlisted personnel between 1965 and 1976 (1). In terms of dollars and manpower losses, the cost to the U.S. Government has been enormous and the reduction of such injuries is essential to protecting the health of Navy personnel and insuring their operational readiness.

To this end, considerable research has been conducted to identify predisposing factors, causes and consequences of accidental and violent injuries and deaths among Navy personnel. Age at enlistment (2-4), educational level (2-3) occupational specialty (3,5), pay grade (4-5), length of service (6), and general aptitude (3) have been identified as influencing accident rates among enlisted personnel. Navy personnel who had been hospitalized for psychiatric disorders, especially those with character and behavior disorders, situational maladjustments and anxiety or depressive neuroses, also have been shown to have elevated rates of accidental and violent deaths (7).

Suicides in the Navy have also been given considerable attention. Schuckit and Gunderson (8) found a relationship between age, psychiatric hospitalization, and the risk of successful suicides among enlisted personnel and Chaffee (9) noted age, pay grade, length of service, and method of injury as salient variables in describing Navy and Marine Corps personnel who completed suicide while on active duty.

Another demographic variable of potential importance in accounting for the risk of accidental and violent deaths among Navy personnel is that of race. Schuckit and Gunderson (7), for example, found black enlisted personnel to be at high risk for homicides and deaths due to accidental causes. Blacks in the general population, particularly black males, also are at risk, relative to whites, for assaults and accidental deaths, but not for suicides (10-13). However, a study of hospitalizations among enlisted males between 1974 and 1979 found that the hospitalization rate for blacks with diagnoses of accidents, poisonings and violence was significantly less than the rate for whites (14). This decreased risk remained after controlling for differences in age, pay grade, length of service, education, and occupation.

The object of this paper was to describe the mortality of Navy personnel between 1974 and 1979 and to determine if blacks were at increased or decreased risk, relative to whites, of death due to accidents, poisonings and violence. With the increase in enlistments of blacks in the Navy in the past decade, an understanding of the etiology of such a risk and its effect on the health and performance of these individuals is critical for Navy policy-makers and health care providers.

METHODS

The Naval Health Research Center maintains an Inpatient Medical Data file which contains all hospitalizations, deaths, and physical examination board findings for active duty

naval personnel for the period 1965-1981. This file was searched for all deaths of personnel diagnosed as having injuries due to accidents, poisonings and violence (ICDA-8 codes 800.0 - 999.9). Death rates were computed for black and white enlisted personnel in the U.S. Navy over the period 1 January 1974 through 31 December 1979. In addition to primary diagnosis, cause of death and trauma classification also were examined. Diagnosis at death is the ICDA-8 diagnosis of body injury while cause of death refers to the source of that injury. Trauma classification indicates whether the death occurred while on or off duty and whether it was self-inflicted or due to an assault by another. Age, sex, pay grade, length of service, and occupation of cases were also identified from this file. Because the number of female cases was insufficient to produce meaningful rates in many of the variable-specific categories, only males were examined in this study.

Population data for the racial groups under investigation were compiled from data files obtained from the Manpower and Personnel Management Information System (NMPC 15642). This data base contains the records of more than two and one-half million personnel on active duty during the study period. The average annual population estimates were derived from an average of the personnel strength figures for each of five quarters per year (December of the previous year, March, June, September, and December). Data from only four quarters were available for 1977. The population at risk for the six year study period was the sum of the average annual population estimates for each year. Relevant demographic variables such as age, race, pay grade, length of service, and occupation were extracted to produce population estimates for each variable, enabling the calculation of variable-specific rates.

Age-adjusted rates for the diagnostic categories and specific diagnoses were calculated using the direct method of adjustment. The standard population was comprised of all active-duty black and white enlisted males during the study period. Death rates are reported for subgroups within the two racial groups divided on the basis of age, occupation, pay grade and length of service.

The rates for the groups and subgroups of blacks and whites were compared to obtain estimates of relative risk by taking the ratio of rates for blacks to rates for whites. Levels of significance of these associations were obtained using 95 percent confidence intervals based on a Poisson distribution for mortality rates (15).

RESULTS

Diagnoses

Between 1974 and 1979 there were 2,687 deaths due to accidents, poisonings and violence among enlisted naval personnel. Of this number, 2,281 were white males and 278 were black males. Table 1 provides a comparison of death rates by selected diagnostic groups. Blacks had a significantly higher total death rate than whites. The age-adjusted rates were almost identical to the crude rates and relative risks remained in the same direction. When the deaths were examined by diagnostic category, blacks were found to be at significant risk, relative to whites, for deaths due to adverse and toxic effects. Deaths

Table 1
Mortality Rates for Accidents, Poisonings and Violence
by Race and Diagnostic Group, Enlisted Males, 1974-1979

Diagnostic Group	Racial Group								
	Whites				Blacks				Relative Risk
	N	Rate*	95 Percent Confidence Limits		N	Rate	95 Percent Confidence Limits		
Fractures	119	5.2	4.3	6.3	7	3.0	1.2	6.2	0.58
Skull	85	3.7	3.0	4.6	5	2.2	0.7	5.1	0.59
Dislocations	2	0.1	0	0.3	1	0.4	0	2.4	4.00
Sprains	1	0.0	0	0.2	0	-	-	-	-
Contusions	1572	69.1	65.7	72.5	145	62.8	52.6	73.0	0.92
Intracranial	263	11.6	10.2	13.1	20	8.7	5.3	13.3	0.75
Unspecified	1174	51.6	48.6	54.5	113	48.9	40.5	59.1	0.95
Wounds-Amputations	105	4.6	3.8	5.6	18	7.8	4.7	12.3	1.70
Chest wound	50	2.2	1.9	2.9	10	4.3	2.1	8.0	1.95
Burns	21	0.9	0.6	1.4	4	1.7	0.5	4.4	1.89
Adverse Effects	67	2.3	2.3	3.8	22	9.5	6.0	14.4	3.28**
Analgesics/Opiates	16	0.7	0.4	1.1	7	3.0	1.2	6.2	4.29**
Drugs unspecified	33	1.4	1.0	2.0	11	4.8	2.4	8.5	3.43**
Toxic Effects	384	16.9	15.2	18.7	80	34.6	27.6	43.3	2.05**
Carbon monoxide	53	2.3	1.7	3.1	3	1.3	0.3	3.8	0.56
Drowning	237	10.4	9.1	11.8	65	20.1	11.9	36.2	2.70**
Asphyxiation	56	2.5	1.9	3.2	8	3.5	1.5	6.8	1.40
Electrocution	25	1.1	0.7	1.6	2	0.9	0.1	3.1	0.82
Complications	10	0.4	0.2	0.8	1	0.4	0	2.4	1.00
Total	2281	100.2	96.1	104.3	278	120.4	106.3	134.5	1.20**
Age-adjusted Total		100.3				121.5			1.21

* per 100,000 person years

** p. < .05

due to unspecified drugs (ICDA-8 Code 977) and analgesic and antipyretics, particularly opiates and synthetic analogs (ICDA-8 Code 965), accounted for most of the racial group difference in deaths due to adverse effects, and drowning (ICDA-8 Code 994.1) accounted for the racial group difference in deaths from toxic effects. No significant racial difference existed with respect to the other diagnostic groups or individual diagnoses.

Type and Place of Trauma

Table 2 provides a comparison of mortality rates by general class of trauma and place of occurrence. As this table indicates, most deaths among both racial groups occurred while

Table 2
Mortality Rates for Accidents, Poisonings and Violence
by Race and Trauma Class, Enlisted Males, 1974-1979

	Racial Group								Relative Risk
	Whites			Blacks					
	N	Rate*	95 Percent Confidence Limits	N	Rate	95 Percent Confidence Limits			
<u>Trauma Class</u>									
Legal Intervention	1	0	0	0.2	0	-	-	-	
Homicide	84	3.7	3.0	4.6	26	11.3	7.3	16.5	
Self-Inflicted	165	7.2	6.2	8.5	14	6.1	3.3	10.8	
Accident Off Duty	1801	79.1	75.5	82.8	216	93.5	81.1	106.1	
Accident On Duty	223	9.8	8.6	11.2	21	9.1	5.6	13.9	
Unknown On/Off Duty	5	0.2	0	0.5	1	0.4	0	2.4	
Other	2	0.1	0	0.3	0	-	-	-	

* per 100,000 person years.

** p. < .05

off-duty. Most of the off-duty accidents were diagnosed as contusions (69 percent) and toxic effects (17 percent). Eighty five percent of the drownings among both racial groups occurred while off-duty. There was a significant difference in crude rates for deaths due to assault by others. When the rates were age-adjusted, the relative risk remained the same.

Cause of Death

Table 3 provides a comparison of mortality rates by specific cause of death. On the basis of this comparison, blacks appeared to be at significant risk for deaths resulting from sports/physical training, guns, poisons/fire, and environmental causes. Whites were at significant risk for traffic fatalities. When age-adjusted, these differences remained about the same. Most of the deaths resulting from sports and physical training and environmental causes (87 percent) were drownings. Deaths due to poisons were usually diagnosed as adverse effects.

Table 3
Mortality Rates for Accidents, Poisonings and Violence
by Race and Cause of Death, Listed Males, 1974-1979

Cause of Death	Whites			Blacks			Relative Risk
	N	Rate*	95 Percent Confidence Limits	N	Rate	95 Percent Confidence Limits	
Air Transport	127	5.6	4.7 8.7	7	3.0	1.2 6.2	0.54
Land Transport	1229	54.0	51.0 57.0	93	40.3	32.7 49.7	0.75**
Water Transport	59	2.6	2.0 3.4	10	4.3	2.1 8.0	1.65
Sports/Physical Training	69	3.0	2.4 3.9	17	7.4	4.3 11.8	2.47**
Medical-Surgical Complications	0	-	- -	1	0.4	0 2.4	-
War	3	0.1	0 0.4	0	-	- -	-
Guns, not War	266	11.7	10.3 13.2	46	19.9	14.6 26.6	1.70**
Machinery/Tools	85	3.7	3.0 4.6	13	5.6	3.0 9.6	1.51
Poisons/Fire	144	6.3	5.4 7.5	31	13.4	9.1 19.1	2.13**
Environmental	128	5.6	4.7 6.7	42	18.2	13.1 24.6	3.25**
Falls/Unspecified	171	7.5	6.4 8.7	18	7.8	4.7 12.3	1.04

* per 100,000 person years.

** p. < .05

On the basis of diagnosis, cause of death, and class of trauma, therefore, blacks appeared to be at significant risk for deaths due to adverse and toxic effects and homicides. To account for this risk, a more detailed examination of these three factors was made.

Adverse Effects

Adverse effects refers to conditions resulting from incorrect or improper use of medications. Toxic effects due to alcohol were also included in this diagnostic group because of its similarity to adverse effects resulting from use of alcohol in combination with medications. As noted above, most of the deaths among both racial groups were attributed to unspecified drugs, followed by adverse effects from analgesics and antipyretics, particularly opiates and synthetic analogs.

A comparison of racial group differences, controlling for age, occupation, pay grade, and

length of service, is provided in Table 4. Meaningful comparisons are restricted by the small number of cases among both racial groups. No discernable relationship between age and mortality rate was observed for either racial group. This was further evidenced in Figure 1. A statistically significant excess risk for blacks was found among 20-30 year old blacks; those who were 25 to 29 years of age displayed the highest relative risk of death.

Table 4

Mortality Rates due to Adverse Effects by Race, Age, Occupation, Pay Grade, and Length of Service, Enlisted Males, 1974-1979

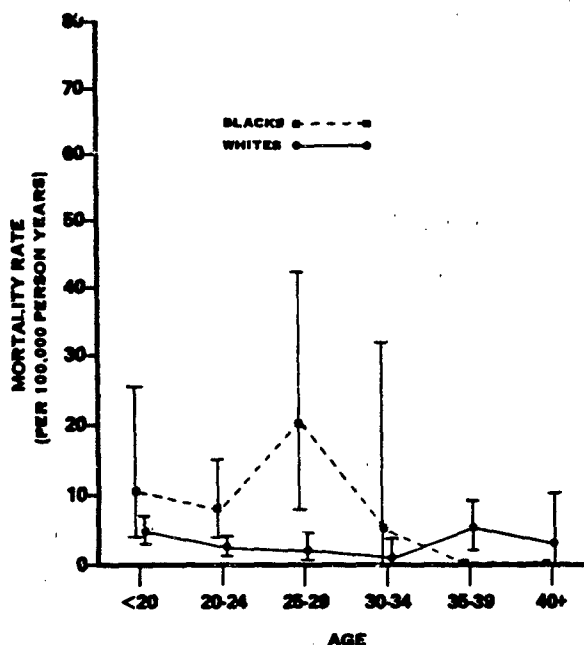
	Racial Group					Relative Risk				
	Whites			Blacks						
	N	Rate*	95 Percent Confidence Limits	N	Rate	95 Percent Confidence Limits				
<u>Age</u>										
17-19	20	4.4	2.7 6.8	5	10.9	3.5 25.4	2.48			
20-24	24	2.5	1.6 3.7	9	8.1	3.7 15.5	3.24**			
25-29	8	2.3	1.0 4.4	7	20.5	8.2 42.1	9.32**			
30-34	4	1.6	0.4 4.2	1	5.7	0.1 31.8	3.56			
35-39	9	4.6	2.1 8.8	0	-	-	-			
40+	2	3.1	0.4 11.0	0	-	-	-			
Total	67	2.9	2.3 3.8	22	9.5	6.0 14.4	3.28**			
<u>Occupation</u>										
Apprentice	18	3.7	2.2 5.9	10	11.7	5.6 21.6	3.16			
Blue Collar	17	1.9	1.1 3.1	2	28.3	15.4 42.2	13.84**			
Clerical	6	2.1	0.8 4.6	1	2.5	0.1 13.9	1.19			
Electronic/Technical	11	2.2	1.1 3.9	3	11.0	2.3 21.1	5.00			
Medical/Dental	13	11.1	5.9 19.0	5	38.7	12.5 90.2	3.49			
Missing Data	2			1						
<u>Pay Grade</u>										
Recruit	5	2.9	0.9 6.7	2	7.2	0.9 26.0	2.48			
Apprentice	13	4.4	2.4 7.6	5	11.6	3.8 27.0	2.64			
Non-rated	12	2.9	1.5 5.1	6	10.7	3.9 23.3	3.69			
3rd Class	19	4.3	2.6 6.8	6	15.3	5.6 33.5	3.56			
2nd Class	6	1.5	0.6 3.3	1	3.6	0.1 20.0	2.40			
1st Class	6	1.8	0.7 3.9	2	9.0	1.1 32.4	5.00			
Chief	13	7.6	4.2 13.4	3	26.5	5.4 77.3	3.40			
Senior/Master Chief	2	3.1	0.4 11.1	0	-	-	-			
<u>Length of Service</u>										
1 year or less	21	2.7	1.7 4.2	8	8.3	3.6 16.4	3.07			
2 years	14	4.5	2.4 7.3	4	11.1	3.0 28.4	2.47			
3 years	5	2.0	0.7 4.7	1	4.5	0.1 24.9	2.25			
4-5 years	3	1.4	0.3 4.0	2	9.8	1.2 35.4	7.00			
6-7 years	7	4.8	1.9 9.8	6	51.3	18.8 111.9	10.69**			
8-9 years	1	1.0	0 5.5	0	-	-	-			
10 years or more	14	2.9	1.6 4.9	1	2.6	0.1 14.6	0.90			

* per 100,000 person years.

** p. < .05

When occupation was controlled, the excess risk of death for blacks was statistically significant among blue collar workers. The highest death rates for both racial groups, however, were found among hospital corpsmen and dental technicians, presumably because they have greater access to drugs and medications than other workers. When length of service was taken into consideration, a statistically significant excess risk remained for blacks with six or seven years of service.

FIGURE 1
MORTALITY RATES DUE TO ADVERSE EFFECTS
BY RACE AND AGE, ENLISTED MALES, 1974-1979



It was hypothesized that the incorrect or improper use of medications and drugs is often the result of an inadequate understanding of the hazards associated with such medication, taken either alone or in combination with alcohol or other forms of medication. The lack of awareness, therefore, would be correlated with the educational level of the subjects. Unfortunately, however, information on the educational level was available only on 55 percent of the white cases and 36 percent of the black cases. The high rate among blue collar blacks would suggest a relationship between lack of education and mortality risk. However, as noted above, the highest rates among both racial groups were among medical and dental personnel, who generally have a higher educational level.

Toxic Effects

Most of the deaths due to toxic effects among both racial groups were drownings, asphyxiations (ICDA-8 Code 994.7), electrocutions (ICDA-8 Code 994.8), and carbon monoxide poisoning (ICDA-8 Code 986.0). Drownings alone accounted for 10.4 percent of all accidental and violent deaths among whites and 23.4 percent among blacks. To investigate the cause of the racial group difference in deaths due to toxic effects, the variables of age, occupation, pay grade, and length of service were examined. The variable-specific rates are provided in Table 5. There appears to be a relationship between age and mortality, although this trend is more clearly evident among whites than it is among blacks (Figure 2). The relative risk of death was statistically significant for 25 to 29 year old blacks.

Despite a decrease in relative risk among blacks in the apprentice and blue-collar rates, the excess risk for blacks of death remained when occupation was controlled, indicating that occupational activity had little effect on mortality risk. Members of both racial

Table 5
Mortality Rates due to Toxic Effects by Race, Age, Occupation,
Pay Grade, and Length of Service, Enlisted Males, 1974-1979

	Racial Group								Relative Risk
	Whites				Blacks				
	N	Rate*	95 Percent Confidence Limits		N	Rate	95 Percent Confidence Limits		
<u>Age</u>									
17-19	159	35.3	30.1	41.3	25	54.5	35.3	80.6	1.54
20-24	146	15.1	12.8	17.8	29	26.2	17.6	37.8	1.74
25-29	37	10.4	7.3	14.3	16	46.8	26.2	75.7	4.50**
30-34	18	7.4	4.4	11.7	5	28.6	9.1	66.5	3.86
35-39	13	6.7	3.6	11.5	5	29.2	9.4	68.0	4.36
40+	11	16.8	8.4	30.1	0	-	-	-	-
Total	384	16.9	15.2	18.7	80	34.6	27.6	43.3	2.05**
<u>Occupation</u>									
Apprentice	100	20.7	17.0	25.3	31	36.4	24.7	51.7	1.76
Blue Collar	136	15.5	13.1	18.5	19	29.5	17.7	46.0	1.90
Clerical	22	7.8	4.9	11.7	13	32.4	17.2	55.4	4.15**
Electronic/Technical	104	20.4	16.8	24.8	13	47.7	25.4	81.6	2.34**
Medical/Dental	15	12.8	7.2	21.1	4	31.0	8.4	79.3	2.42
Missing Data	7				0				
<u>Pay Grade</u>									
Recruit	20	11.5	7.0	17.6	7	25.2	10.1	52.0	2.19
Apprentice	93	31.8	25.8	39.2	15	34.8	19.5	57.4	1.09
Non-rated	88	21.3	17.2	26.5	28	49.9	33.2	72.4	2.34**
3rd Class	89	20.4	16.5	25.3	14	35.8	19.6	60.2	1.75
2nd Class	51	13.0	9.7	17.1	11	39.5	19.7	70.7	3.04**
1st Class	22	6.6	4.1	9.9	2	9.0	1.1	32.4	1.36
Chief	13	7.8	4.2	13.4	3	26.5	5.4	77.3	3.40
Senior/Master Chief	8	12.3	5.3	24.2	0	-	-	-	-
<u>Length of Service</u>									
1 year or less	139	18.2	15.3	21.5	28	29.1	19.3	42.2	1.60
2 years	79	25.2	20.1	31.5	20	55.5	33.9	85.5	2.20**
3 years	48	19.5	14.4	25.9	3	13.4	2.7	39.1	0.69
4-5 years	41	18.7	13.4	25.3	8	39.2	16.9	77.3	2.10
6-7 years	16	10.9	6.2	17.7	9	77.0	35.3	146.3	7.06**
8-9 years	14	13.8	7.5	23.2	1	16.9	0.4	94.0	1.22
10 years or more	40	8.3	5.9	11.2	8	20.9	9.0	41.2	2.52

* per 100,000 person years.

** p. < .03

groups who were in the apprentice rates (seaman, airman, constructionman) and in the electronic and technical rates (e.g., sonar technician) displayed the highest rates.

When the rates were adjusted for pay grade, a statistically significant excess risk was found among black non-rated personnel and 2nd class petty officers. When the rates were adjusted to account for differences in length of service, the excess risk for blacks remained statistically significant for those with two years and between six and seven years of service.

Homicides

Homicides accounted for 3.7 percent and 9.3 percent of all deaths due to external causes among enlisted white and black males respectively. Almost all of the assaults on enlisted personnel resulted in diagnoses of contusions or wounds and amputations. A distribution of assault deaths by age, race, occupation, pay grade and length of service is provided in Table 6. While the homicide rate tends to decrease with age among white males, the

FIGURE 2
MORTALITY RATES DUE TO TOXIC EFFECTS
BY RACE AND AGE, ENLISTED MALES, 1974-1979

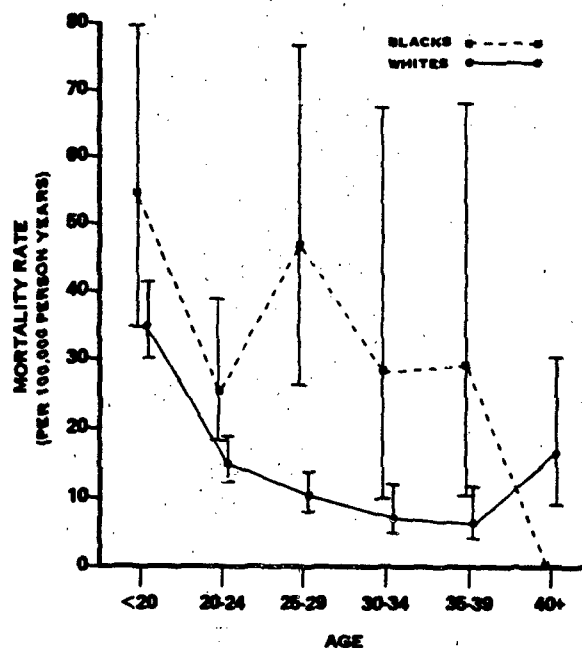
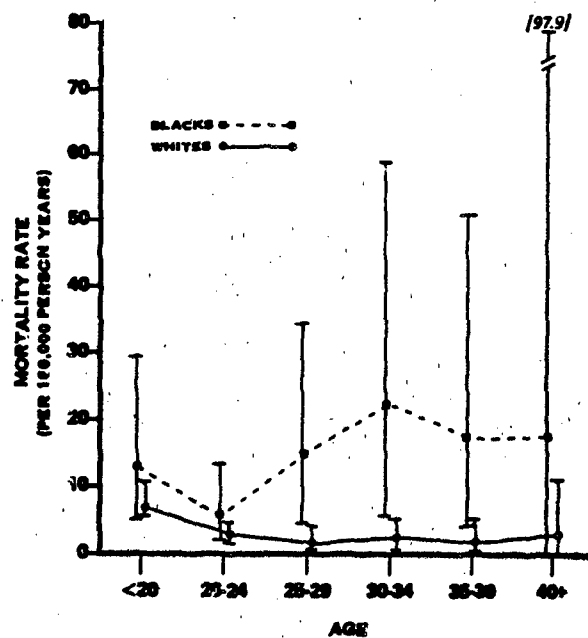


FIGURE 3
MORTALITY RATES DUE TO HOMICIDES
BY RACE AND AGE, ENLISTED MALES, 1974-1979



opposite trend is observed among black males. This is also noted in Figure 3. Blacks between the ages of 25 and 39 were particularly at risk relative to whites in the same age groups. When occupation was controlled for, a statistically significant risk was observed for blacks in the electronics and technical rates. A statistically significant relative

Table 6

Mortality Rates due to Homicides by Race, Age, Occupation,
Pay Grade, and Length of Service, Enlisted Male, 1974-1979

	Racial Group						Relative Risk	
	Whites			Blacks				
	N	Rate*	95 Percent Confidence Limits		N	Rate	95 Percent Confidence Limits	
<u>Age</u>								
17-19	33	7.3	5.0	10.3	6	13.1	4.8	28.5
20-24	32	3.3	2.3	4.7	7	6.3	2.5	13.1
25-29	7	2.0	0.8	4.1	5	14.6	4.7	34.0
30-34	6	2.5	0.9	5.4	4	22.8	6.2	58.5
35-39	4	2.1	0.6	5.3	3	17.5	3.6	51.1
40+	2	3.1	0.4	11.0	1	17.6	0.4	97.9
Total	84	3.7	3.0	4.6	26	11.3	7.3	16.5
<u>Occupation</u>								
Apprentice	22	4.6	2.9	6.9	9	10.6	4.3	20.1
Blue Collar	37	4.2	3.0	5.8	6	9.3	3.4	20.3
Clerical	5	1.8	0.6	4.1	4	10.0	2.7	25.5
Electronic/Technical	15	2.9	1.6	4.9	6	22.0	8.1	48.0
Medical/Dental	4	3.4	0.9	8.8	1	7.7	0.2	43.2
Missing Data	1				0			
<u>Pay Grade</u>								
Recruit	6	3.4	1.3	7.5	1	3.6	0.1	20.0
Apprentice	19	6.5	3.9	10.1	6	13.9	5.1	30.3
Non-rated	22	5.3	3.3	8.0	4	7.1	1.9	18.3
3rd Class	16	3.7	2.1	5.9	4	10.2	2.8	26.2
2nd Class	9	2.3	1.0	4.3	5	17.9	5.8	41.8
1st Class	10	3.0	1.4	5.5	2	9.0	1.1	32.4
Chief	2	1.2	0.1	4.3	4	35.3	9.6	90.3
Senior/Master Chief	0	-	-	-	0	-	-	-
<u>Length of Service</u>								
1 year or less	22	2.9	1.8	4.3	8	8.3	3.6	16.4
2 years	29	9.2	6.2	13.3	3	8.3	1.7	24.3
3 years	9	3.7	1.7	6.9	1	4.5	0.1	24.9
4-5 years	6	2.7	1.0	6.0	2	9.8	1.2	35.4
6-7 years	2	1.4	0.2	4.9	3	25.7	5.3	74.9
8-9 years	2	2.0	0.2	7.1	0	-	-	-
10 years or more	13	2.7	1.4	4.6	8	20.9	9.0	41.2

* per 100,000 person years.

** p. < .05

risk also was observed for 2nd class and chief petty officers and blacks who have been in the service for six or more years.

DISCUSSION

Although black enlisted males had less of a risk for hospital admissions during the study period with diagnoses of accidents, poisonings and violence, relative to whites, they had a greater risk of accidental and violent deaths. It appears that this is due to particularly significant risks for death from homicides, adverse effects, and drownings. Similar risks of death due to these external causes have been observed for all blacks in the United States (10-13). Drowning, for example, is three times more common among blacks than whites in the general population (16). With respect to homicides, however, the rate for enlisted black males was approximately one-fifth of the homicide rate for black males in the general population during the 1974-1979 study period (17), and the risk relative to enlisted white males was only one half of the risk for blacks relative to whites in the general population.

With respect to the divergence between hospitalization and mortality rates found in this study, a similar pattern has been reported for blacks in the general population. Iskran and Joliet (12), for example, note that nonwhites have a higher death rate from accidental injuries than do whites but the injury rate as determined by the National Health Survey is higher for whites. Socioeconomic status, culture (including patterns of use of medical facilities), and the nature of the work performed were suggested as contributing factors to this discrepancy.

The nature of the work performed does not appear to account for the racial group difference in accidental and violent deaths among enlisted personnel. The results of this study indicate that blacks are not exposed to any more severe on-duty occupational or environmental hazards, with the exception of drowning, than whites. They are exposed, however, to a greater risk of assault by others, due perhaps to their racial status and off-base residential environments.

Socioeconomic status among Navy personnel is measured by educational level, pay grade, and occupational speciality. The results of this study indicate that socioeconomic status does not appear to be implicated in the racial differences in deaths due to adverse and toxic effects. There was no consistent relationship between mortality rate and pay grade for either racial group, and black and white unskilled and blue collar workers did not necessarily have the highest mortality rates. With few exceptions, the excess risk for blacks due to these factors remained when pay grade and occupational specialty are controlled. Moreover, the risk of death for blacks due to homicide appears to be positively correlated with socioeconomic status as measured by occupation and pay grade.

Socioeconomic status prior to enlistment in the service may be of relevance in understanding racial differences with respect to some diagnostic categories. Unfortunately, that information was unavailable for investigation in this study. However, a combination of socioeconomic and cultural factors may possibly account for the racial group differences observed in this study. For example, a previous study of racial group differences in patterns of drug abuse (18) found blacks to have higher rates of opiate and other forms of drug abuse than whites. The illicit use of drugs, particularly opiates, was found not to be a new or unique experience among black enlisted personnel, but rather an extension of established subcultural patterns.

The combination of socioeconomic and cultural factors also may play a role in accounting for the discrepancy with respect to hospital admissions and deaths due to adverse and toxic effects but the exact nature of this role is unclear. It is possible that blacks may be underreporting injuries associated with these factors because of culturally-biased attitudes toward the use of modern health care facilities. Even though blacks and whites have equal access to modern health care facilities while in the Navy, equal access prior to enlistment is unlikely given the trend of socioeconomic differences found in the general population. Not having had access to such facilities in civilian life may result in the development of a system of beliefs and attitudes among lower-class blacks which does not view treatment in the modern health care system as a realistic alternative.

While the results presented in this study were inconclusive, this possibility merits further research.

The high risk of deaths due to drowning for blacks poses a special problem. It is conceivable that such deaths are alcohol-related in much the same manner as auto accidents. However, this does not appear to be the case as enlisted black males usually drink less than their white counterparts, as evidenced by low rates of hospitalization for alcohol abuse (14) and low participation in alcohol rehabilitation programs (19). A more probable explanation is that blacks may be drowning more frequently because they have not been exposed, as much as their white counterparts, to swimming and swimming lessons prior to enlistment. Learning to swim may not be as common among black American youth, especially among those living in urban areas without access to swimming facilities, as it is among white youth. In a study of drowning deaths in Maryland in 1972, Dietz and Baker (20) noted that the high rates among males and among blacks suggest that black males are the group most in need of water safety instruction. However, all Navy personnel are required to pass a swimming test before leaving basic training. Lack of exposure, therefore, cannot account for all drownings. Nevertheless, there is a substantial difference between knowing how to swim and passing a qualifying test and feeling comfortable in the water. Without a cultural tradition of water safety, blacks may be at risk for drowning even though they have taken swimming lessons and can pass the qualifying test.

One final observation pertains to the high risk of death for adverse and toxic effects and homicides among enlisted black males who are 25 years of age or older and have been in the Navy for six or more years. If the risk of accidents, poisonings and violence is indeed tied to pre-service sociocultural factors, this risk for older blacks may reflect sociocultural differences in the population of black enlisted personnel and suggest that the death rates among blacks may eventually decline to the point where there are no significant racial group differences.

In conclusion, pre-service sociocultural factors appear to account for the black risk in accidental and violent deaths in the U.S. Navy, particularly with respect to drownings, adverse effects of drugs and medications, and homicides. It is impossible to eliminate all environmental hazards and social stressors which contribute to accidental injury and violent death in the Navy. However, at a minimum, greater awareness of the hazards of improper use of drugs and medications and greater concern for water safety, especially among older black males, is certainly indicated.

NOTES

1. Level of education was not recorded in the service records of enlisted personnel until July 1973; hence this information is lacking for many of the cases, especially among those who enlisted prior to 1973.

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opiates and synthetic analogs. The risk of death from toxic effects for blacks was twice as great as the risk for whites, with drownings accounting for the largest percentage of these deaths among both racial groups. The homicide rate for blacks also was three times greater than the homicide rate for whites. No consistent relationship between mortality, age, and in-service socioeconomic status was discerned for either racial group. Pre-service sociocultural factors do appear to be implicated in the risk of death from adverse effects and drowning among blacks, however. Greater awareness of the hazards of improper use of drugs and medications and greater concern for water safety, especially among older black males, was indicated.

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